Memorandum

To: ROB JAMMERMAN, WENATCHEE PUBLIC WORKS

CC: GARY OWEN, P.E. WENATCHEE PUBLIC WORKS

From: JOSH FEDORA, P.E, & JOHN DAVIES, PTP, KPG, INC.,

Date: February 7, 2019

Re: TRANSIT AND BRT RECOMMENDATIONS FOR NORTH WENATCHEE AVENUE

Project No: KPG: 17124, CITY: 1720

Background and Overview

The City of Wenatchee tasked KPG to evaluate the White Paper authored by Steve King, P.E. (City of Wenatchee) and provide our recommendations for BRT transit improvements along the corridor that dovetail with design alternatives generated by KPG as part of the SR 285 / North Wenatchee Avenue Preliminary Engineering. The White Paper proposes multiple options and ideas for design solutions for transit along the North Wenatchee Avenue.

Funding has been allocated for portions of North Wenatchee Avenue that are identified as priority projects with Connecting Washington dollars. While this funding is not intended to provide for a BRT system along the corridor. Planned transit improvements are expected to be coordinated with Connecting Washington and other transportation improvement funds to enhance the overall safety and capacity of the corridor, and accommodate a future BRT system if it is needed. The transit recommendations presented here are intended to identify transit improvements that could accommodate future BRT and are well coordinated with the established design objectives of the SR 285 / North Wenatchee Avenue Preliminary Engineering Design project. Incorporating transit considerations into the preliminary design may also have the added benefit of informing zoning and redevelopment decisions in the near-term.

The preliminary engineering effort on North Wenatchee Avenue considers multiple design scenarios including the presence of or absence of Confluence Parkway (a proposed bypass of North Wenatchee Avenue on the east side of the tracks, currently undergoing environmental review). If Confluence Parkway is constructed, it is expected that regional buses will move off the North Wenatchee Avenue corridor onto the new parkway. The recommendations presented here are intended to produce transit benefit for both scenarios (regional and local routes in the near term, and local routes only in the long term).

The future Confluence Parkway will connect to North Wenatchee Avenue in the vicinity of Miller and Maple and is expected to result in a significant reconfiguration of both intersections.

As a result, it is anticipated that long-term transit improvements at Miller and Maple will be re-evaluated with future design efforts for Confluence Parkway.

After a review of the current design work and a review of the ideas presented in the White Paper, we have generated the following recommendations for transit improvements along the North Wenatchee Avenue corridor, organized by intersection. These recommendations are based on traffic analysis completed as part of the preliminary design project. It is anticipated that this document will undergo stakeholder review prior to the finalization. Figures for this memo are schematic, and it is expected that the concepts in the finalized memo may be incorporated into the design at the direction of the City.

Horselake and Duncan Road Intersection

Current Transit Stops: (None)

RECOMMENDATIONS:

Southbound

- Buses use curb lane (no change)

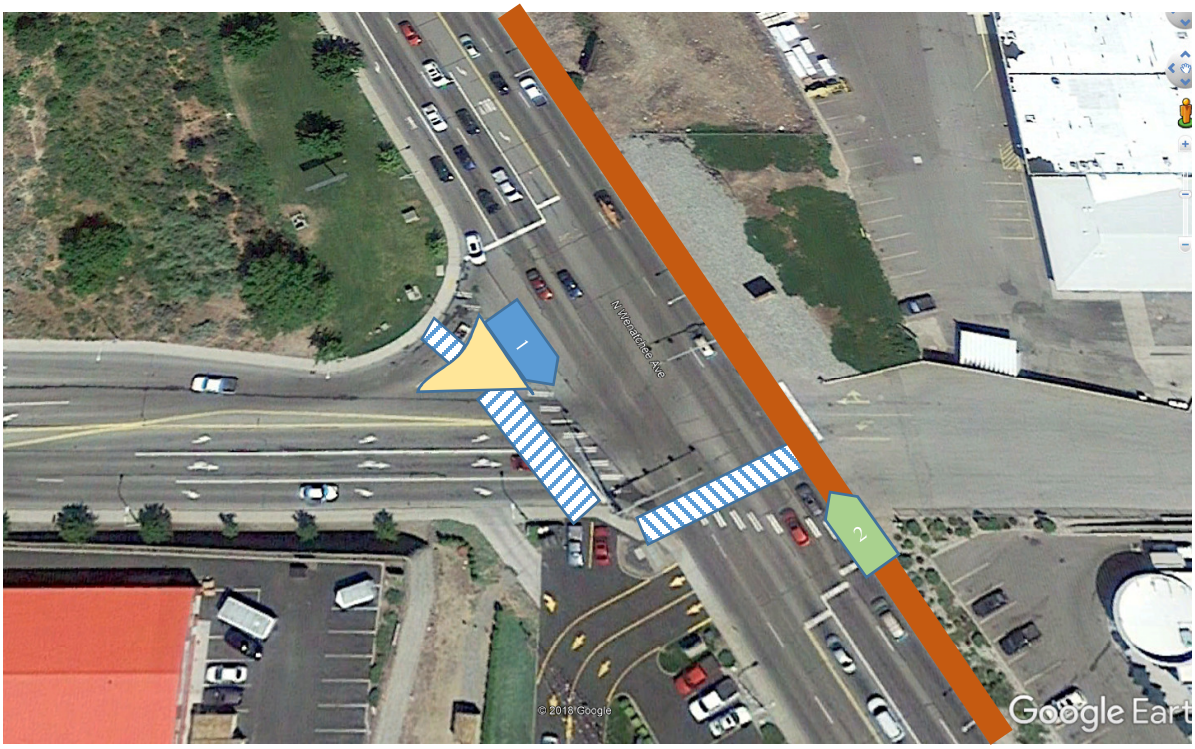
Northbound

- Utilize proposed new outside lane extending from south of Maiden Lane to north of Duncan Road.
- Transit stop #1 (as shown above) relocated to Maiden Lane.

Maiden Lane Intersection

Current Transit Stops:

- Southbound (In-lane, far-side, South of EZ's),
- Northbound (In-lane, far-side / mid-block to Horselake Rd)



RECOMMENDATIONS:

Southbound

- Relocate bus stop to island #1.
  - Near side island stop "bus only"
  - Evaluate need to configure right turn lane to maintain free right turns during up to a two bus queue. Current use indicates that a two bus queue is rare.
  - The viability of this option will depend upon an evaluation of existing grades to accommodate the widening for right turn onto Maiden Lane.
  - Buses are 40' long and need 60' min.
- Widen island and relocate crosswalk.
- Add queue jump coordinated with southbound U-turn on the far side.
- Bus can also merge with traffic during SB green using U-turn lane as acceleration.

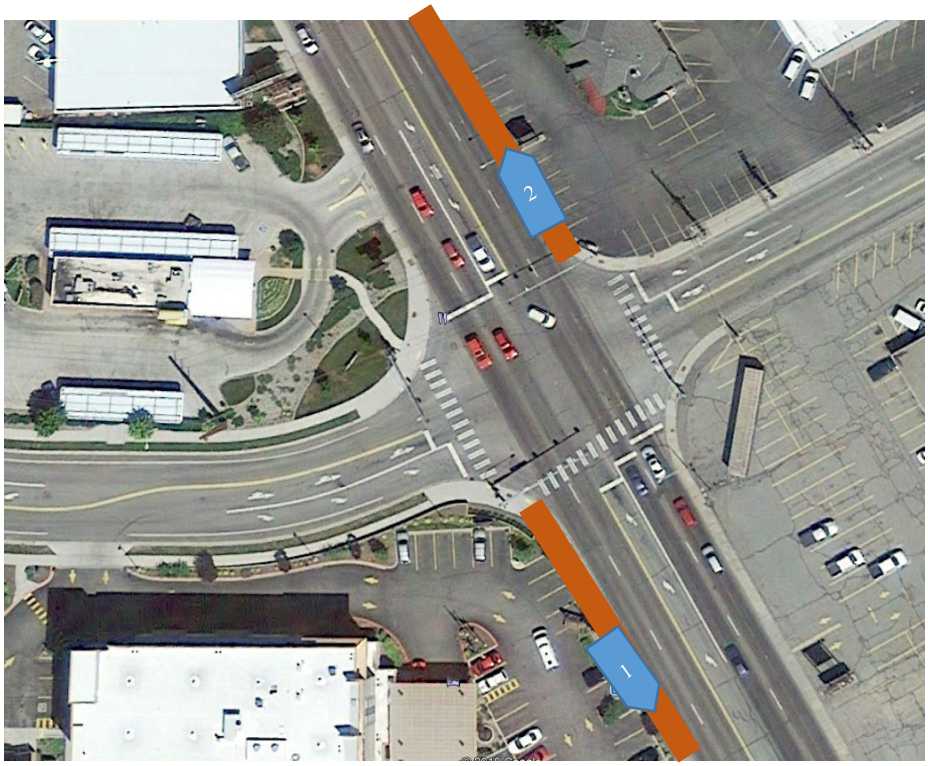
Northbound

- Relocate NB bus stop to near side stop just north of the Starbuck's driveway in the proposed new outside lane. This would accommodate an intersection configuration with no north leg crosswalk, which is desirable for traffic considerations.

Hawley Road/Walnut Road Intersection

Current Transit Stops:

- Southbound (in-lane, far side, near Springhill Suites),
- Northbound (in-lane, near-side, at Les Schwab Tires)



RECOMMENDATIONS:

Southbound

- Expand U-turn area to accommodate bus stop (far-side) at #1.
- No bus bypass
- TSP strategy with signal "hold" to facilitate bus exits.

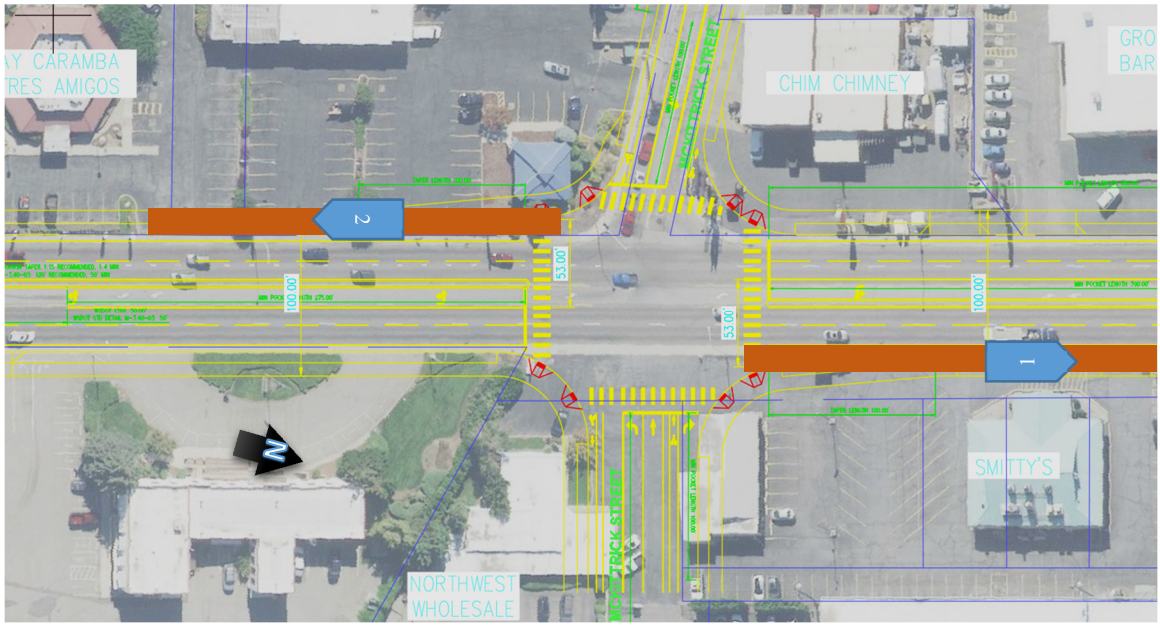
Northbound

- Expand U-turn area to accommodate bus stop (far-side) at #2
- Evaluate need to provide a two-bus queue. NB buses are often close together.
- No bus bypass
- TSP strategy with signal "hold" to facilitate bus exits.
- Proposed stop locations for Hawley and McKittrick need to be implemented together.

McKittrick St Intersection

Current Transit Stops:

- Southbound (In-lane, near-side, adjacent to Grocery Outlet),
- Northbound (In-lane, near-side, adjacent to old WSDOT facility)



RECOMMENDATIONS:

Southbound

- Expand U-turn area to accommodate bus stop (far-side) at #2
- No bus bypass/right turn
- TSP strategy with signal "hold" to facilitate bus exits.

Northbound

- Expand U-turn area to accommodate bus stop (far-side) at #1
- Evaluate need to provide a two-bus queue. NB buses are often close together.
- Optional: bus bypass/right turn on south leg
- TSP strategy with signal "hold" to facilitate bus exits.
- Proposed stop locations for Hawley and McKittrick need to be implemented together.

Maple Street Intersection

Current Transit Stops:

- Southbound (In-lane, mid-block near Money Tree),
- Northbound (on Maple Street not on North Wenatchee Avenue)

RECOMMENDED:

Southbound

- Consider eliminating current SB Maple stop and consolidating with proposed transit stop location at McKittrick.

Northbound

- No recommendation at this time. The existing stop location is located on Maple Street and not on North Wenatchee Avenue. Depending on the timing of Confluence Parkway, it may be desirable to consider improvements as part of that design effort. However, if near-term improvements are made, a more generous curb radius for right turns onto North Wenatchee Avenue would benefit bus operations.

APPENDIX A

FTA GUIDANCE

COMPARATIVE ANALYSIS OF BUS STOP LOCATIONS

https://www.transit.dot.gov/research-innovation/stops-spacing-location-and-design

Federal Transit Administration

About Funding Regulations & Guidance

- Research & Innovation
- Research & Reports
- Technology
- Training and Workforce Development
- Bus Rapid Transit
- International Public Transportation Program
- Bus Testing
- Recipient Resources
- Related Links
- FAQ

Comparative Analysis of Bus Stop Locations

Stop Type	Advantages	Disadvantages
Near Side	• Minimizes interference when traffic is heavy on the far side of the intersection • Passengers access buses closest to crosswalk • Intersection available to assist in pulling away from curb • No double stopping • Buses can service passengers while stopped at a red light • Provides driver with opportunity to look for oncoming traffic including other buses with potential passengers	• Conflicts with right turning vehicles are increased • Stopped buses may obscure curbside traffic control devices and crossing pedestrians • Sight distance is obscured for crossing vehicles stopped to the right of the bus. • The through lane may be blocked during peak periods by queuing buses • Increases sight distance problems for crossing pedestrians
Far Side	• Minimizes conflicts between right turning vehicles and buses • Provides additional right turn capacity by making curb lane available for traffic • Minimizes sight distance problems on approaches to intersection • Encourages pedestrians to cross behind the bus • Requires shorter deceleration distances for buses • Gaps in traffic flow are created for buses re-entering the flow of traffic at signalized intersections	• Intersections may be blocked during peak periods by queuing buses • Sight distance may be obscured for crossing vehicles • Increases sight distance problems for crossing pedestrians • Stopping far side after stopping for a red light interferes with bus operations and all traffic in general • May increase number of rear-end accidents since drivers do not expect buses to stop again after stopping at a red light

APPENDIX B

ADDRESSING TRANSIT ON NORTH WENATCHEE AVENUE

WHITE PAPER

Addressing Transit on North Wen. Ave. White Paper

Problem Statement: Determining how to address transit needs on North Wenatchee Avenue is a key decision point which has a substantial impact on the form and function of the roadway as well as the cost in context of the scope of work for the approximately $18 Million in presently available for improvements to North Wenatchee Avenue.

Link Transit's Challenge: Link Transit is and will continue to experience operational cost increases due to congestion on North Wenatchee Avenue which causes delay in service. The cost increase involves deploying more transit vehicles to maintain service. There are two categories of impacts. One is the through busses which are destined for Columbia Station without stops on N. Wen. Ave. The second are the bus routes which have stops serving North Wenatchee Avenue businesses. To address operational issues for the first category, a bypass corridor is recognized as the ultimate solution. To address the second category, improved operational features can reduce bus delays. A bypass corridor will also help curtail congestion caused delays for the second category as well.

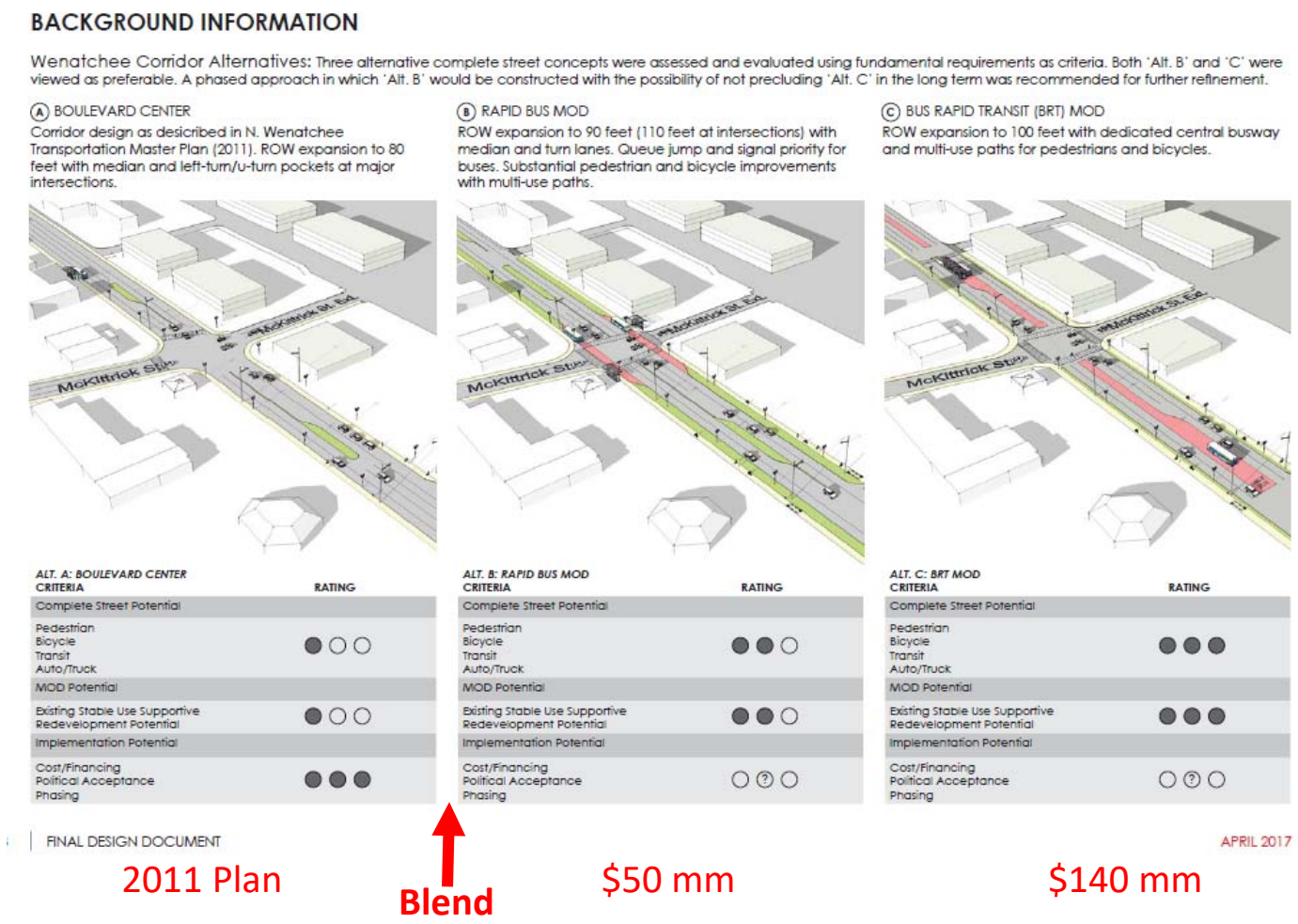
Addressing Transit on North Wen. Ave. White Paper

Link Transit's Position: Throughout the work planning for North Wenatchee Avenue, Link Transit has looked to the city to specify how the city would like Transit incorporated into the City's development plans for North Wenatchee Avenue. This includes not only the form and function of the street, but also the development pattern the city wishes to incentivize Tor shape. Link Transit is appropriately cognizant of the impacts of transit systems on the cost of and the impacts to the area depending on the chosen solution. Link Transit wants the transit solution to be appropriately scaled for Wenatchee such that great impacts are not driven by Transit solutions. At the same time, transit solutions are desired until funding is available for the ultimate solution for North Wenatchee Avenue which is currently identified as Confluence Parkway in the 2011 North Wenatchee Plan.

Like traffic mobility, Link recognizes that the Connection Washington project alone does not solve all of the transit problems. Thus, solutions need to be derived appropriately scaled for the current project in hand recognizing that a much larger and more expensive project will be forthcoming for North Wenatchee Avenue.

Background

The form and function study addressed the question of what level of improvements should be planned for North Wenatchee Ave. at this time. Three options were evaluated ranging from the status quo, to a spot improvements, to a full BRT system with dedicated bus lanes. See below clip.



BACKGROUND INFORMATION

Wenatchee Corridor Alternatives: Three alternative complete street concepts were assessed and evaluated using fundamental requirements as criteria. Both 'Alt. B' and 'C' were viewed as preferable. A phased approach in which 'Alt. B' would be constructed with the possibility of not precluding 'Alt. C' in the long term was recommended for further refinement.

(A) BOULEVARD CENTER
Corridor design as desicribed in N. Wenatchee Transportation Master Plan (2011). ROW expansion to 80 feet with median and left-turn/u-turn pockets at major intersections.

(B) RAPID BUS MOD
ROW expansion to 90 feet (110 feet at intersections) with median and turn lanes. Queue jump and signal priority for buses. Substantial pedestrian and bicycle improvements with multi-use paths.

(C) BUS RAPID TRANSIT (BRT) MOD
ROW expansion to 100 feet with dedicated central busway and multi-use paths for pedestrians and bicycles.

McKittrick St.

ALT. A: BOULEVARD CENTER

CRITERIA	RATING
Complete Street Potential	
Pedestrian Bicycle Transit Auto/Truck	●○○
MOD Potential	
Existing Stable Use Supportive Redevelopment Potential	●○○
Implementation Potential	
Cost/Financing Political Acceptance Phasing	●●●

ALT. B: RAPID BUS MOD

CRITERIA	RATING
Complete Street Potential	
Pedestrian Bicycle Transit Auto/Truck	●●○
MOD Potential	
Existing Stable Use Supportive Redevelopment Potential	●●○
Implementation Potential	
Cost/Financing Political Acceptance Phasing	○?○

ALT. C: BRT MOD

CRITERIA	RATING
Complete Street Potential	
Pedestrian Bicycle Transit Auto/Truck	●●●
MOD Potential	
Existing Stable Use Supportive Redevelopment Potential	●●●
Implementation Potential	
Cost/Financing Political Acceptance Phasing	○?○

FINAL DESIGN DOCUMENT APRIL 2017

2011 Plan **Blend** $50 mm $140 mm

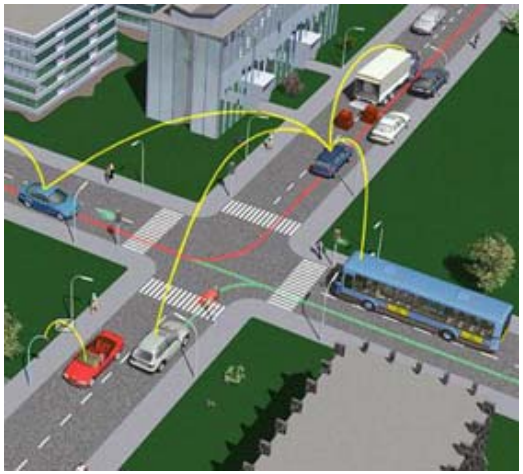
Background

Background: Where does the highway end and the city begin?

These two signals are key in how they operate together analogous to Stevens and Ferry at the West end of the Sellar Bridge. This transition spot provides great opportunity for Transit.

Intelligent Transportation Systems Active Signal Priority System

ITS has been included as a key component of the Connection Washington Funding recognizing that this technology needs to be implemented to make up for the lack of funding for traditional transportation improvements. It is part of practical solutions. ITS has a critical role in Transit operations and can impact both categories of transit services, through buses, and the bus service on the Avenue. Active Signal Priority systems also addresses the local routes serving the area. Active Signal Priority is the most advanced application of ITS for transit purposes.



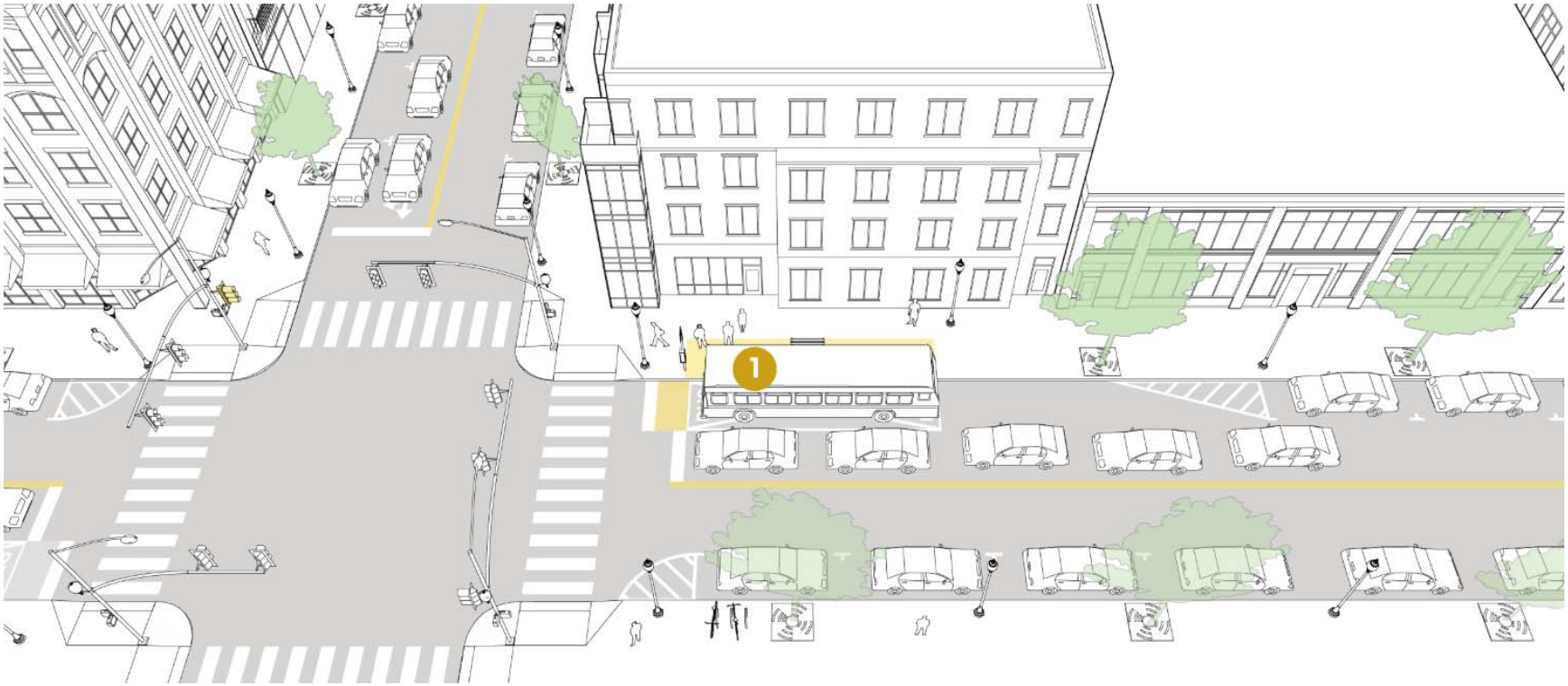
Resources

https://nacto.org/publication/transit-street-design-guide/intersections/signals-operations/active-transit-signal-priority/

https://www.apta.com/resources/standards/Documents/APTA-BTS-BRT-RP-002-10.pdf

Queue Jump Options

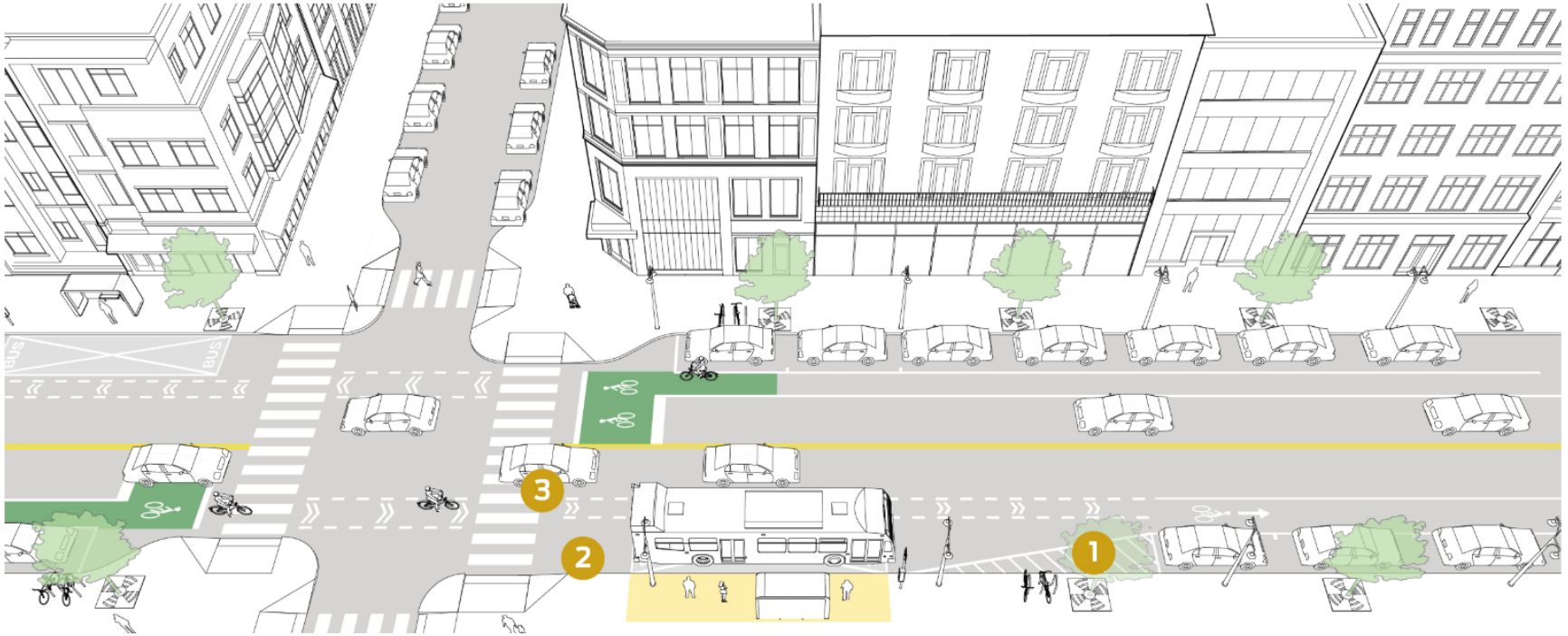
NEAR-SIDE PULL-OUT STOP



With Near side stop… signal provides bus priority to give the bus a head start at the light. The upstream queue jump lane doesn't need to be very long, because the bus flows with traffic and then pulls out of traffic to service the stop. The signal then lets the bus go first.

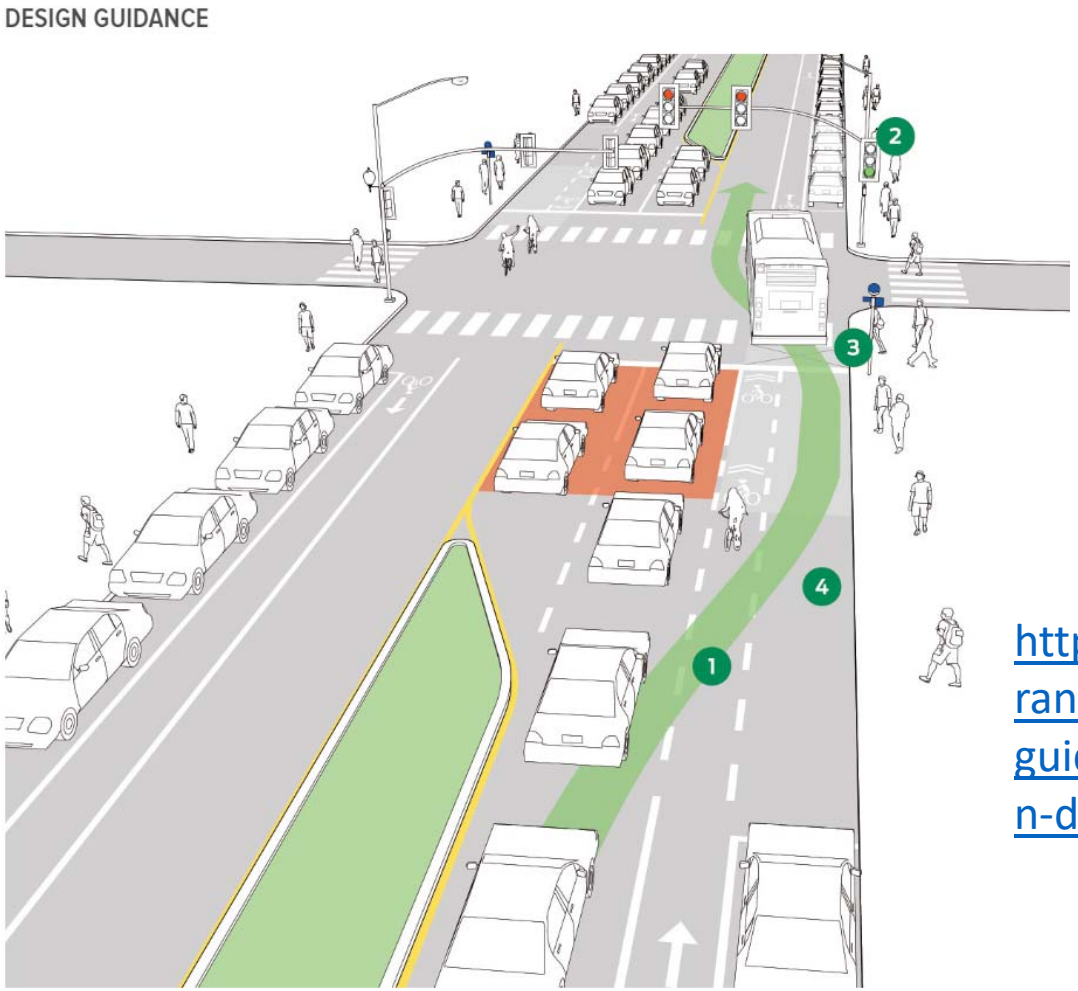
Queue Jump Options

FAR-SIDE PULL-OUT WITH BIKE LANE



With a far side stop signal stops traffic to let bus into travel lane. This is really not a queue jump, but rather a downstream stop. This area could double as a receiving lane for u-turns with a slightly larger area to allow u-turns to happen even when a bus occupies the stop.

Queue Jump Options



Traffic Signal Operations allow bus to access que jump lane. Signal then gives priority green light to bus. See the SWIFT video at I5 and 128th. This might be the only real queue jump on the corridor at Walmart.

https://nacto.org/publication/transit-street-design-guide/intersections/intersection-design/queue-jump-lanes/

Swift BRT – Snohomish Co. Transit

128th Near I5

https://snohomishcountywa.gov/DocumentCenter/View/7061/RolandBehee-CommunityTransit?bidId=

Swift BRT – Snohomish Co. Transit

128th Near I5

The Vine… Vancouver, WA - BRT

https://www.c-tran.com/about-c-tran/transit-matters/583-mill-plain-brt

Vancouver, WA BRT

Vancouver, WA BRT

Vancouver, WA BRT

Vancouver, WA BRT

Vancouver, WA BRT

Recommended Transit Approach

Approach: Prepare a solution that relies on Active Signal Priority System with minimal right of way acquisition. This approach could be progressively built to be a true on street Bus Rapid Transit System. This approach includes combination of short queue jump lanes (if appropriate), downstream, and upstream stops depending on location. The key factor is smart traffic signal operation make each of these solutions effective whereas by themselves, they are ineffective. An in lane curb side BRT system could be obtained with the project with Link Transits financial help. Link Transit could apply for funding to help establish the speed loading bus stops similar to SWIFT in Snohomish County. This would be consistent and yet more refined that the concept floated in the 2018 INFRA grant application. If Transit funding cannot be obtained, then the system operates at a very scaled back version where most of the gain in operational efficiency is realized through ITS. If a BRT grant can be obtained, then interruption to traffic is minimized and greater efficiency is realized. BRT stops involved short sections of widened right of way. Acquisition of right of way in these areas could be part of the Connection WA project to facilitate building of stops when funding is obtained.

This approach allows the project to progress and provides the basis for securing transit funding to further the objectives. Meanwhile, it recognizes that the ultimate solution for the North Wenatchee Avenue corridor requires a $100 Million plus investment which is currently identified as Confluence Pkwy. If the Alt. analysis for C-Pkwy says that N. Wen. Ave. needs widening, then we are looking at $100 Million plus on N. Wen. Ave.

Next Steps: If this approach to transit investment is agreed upon by the project team, then pursue formal authorization by the Link Board and begin the process of securing grants that will help implementation of ITS and provide infrastructure funding for the key stop development consistent with a on street BRT system. This needs to be completed prior to 2019 INFRA application.